



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/737,357	12/16/2003	Scott Rickbeil Frerichs	CH2948USNA	5989
23906 7590 01/03/2007 E I DU PONT DE NEMOURS AND COMPANY LEGAL PATENT RECORDS CENTER BARLEY MILL PLAZA 25/1128 4417 LANCASTER PIKE WILMINGTON, DE 19805			EXAMINER TSOY, ELENA	
			ART UNIT 1762	PAPER NUMBER
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		01/03/2007	PAPER	

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/737,357

Applicant(s)

FRERICHS ET AL.

Examiner

Elena Tsoy

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 9 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-8, 10 and 11 is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 6/28/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-8, and 10-11, drawn to a process for passivating titanium dioxide nanoparticles, classified in class 427, subclass 407.1.
- II. Claim 9, drawn to a composition for screening ultra violet radiation, classified in class 424, subclass 59.

Distinctness

The inventions are distinct, each from the other because:

Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product. See MPEP § 806.05(h). In the instant case the product made by claimed process can be used for preparing a *thermoplastic* composition wherein passivated TiO₂ nanoparticles are dispersed in a thermoplastic material.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Jessica M. Sinnott on December 21, 2006 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-8, and 10-11. Affirmation of this election must be made by applicant in replying to this Office action. Claim 9 is withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Art Unit: 1762

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

Claim Objections

1. Claim 3 is objected to because of the following informalities: "sodium silica" should be changed to "sodium silicate".

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 3 is rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for pH 8.5-10.9 at time contacting the titanium dioxide particles with sodium silicate (See spec., page 4, lines 3-6 and Examples), does not reasonably provide enablement for "a pH of *at least* about 10". The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims. The specification does not reasonably provide enablement for a pH of 11-14 at a time of contacting the titanium dioxide particles with sodium silicate.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Art Unit: 1762

5. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites that each silica and alumina is deposited onto the titanium dioxide nanoparticles in an amount ranging from about 5 weight percent to about 18 weight percent based on the weight of the titanium dioxide nanoparticles in the mixture, which renders the claim indefinite because it is not clear how 5-18 wt % was calculated: whether it was calculated as being based on wet uncured hydrous oxide or on *resulting* oxide and treated or untreated TiO₂. For examining purposes claimed amount of 5-18 wt % was interpreted as being calculated, according to the specification, as being based on wet uncured hydrous oxide and untreated TiO₂ because the specification as filed shows that silica is present in *resulting* pigment (i.e. as oxide) in an amount within a range of 3.9-10.1, and alumina is present in *resulting* pigment (i.e. as oxide) in an amount within a range of 3.2-14.5 (See page 15, Table 1).

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with

Art Unit: 1762

this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 10-11 are rejected on the ground of nonstatutory double patenting over claims 1, 3-5, 8 of U. S. Patent No. 6,783,586 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the current application claiming common subject matter but broader in scope.

Furthermore, there is no apparent reason why applicant was prevented from presenting claims corresponding to those of the instant application during prosecution of the application which matured into a patent. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

8. Claims 1, 3-5, and 8 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 3-5, 8 of U.S. Patent No. 6,783,586. Although the conflicting claims are not identical, they are not patentably distinct from each other because although '586 does not expressly teach that alumina is deposited in an amount within a range of 5-18%, it is the Examiner's position that 4% amorphous alumina of Bettler et al in the *resulting* pigment of Bettler et al corresponds to an amount of uncured wet alumina within claimed range of 5-15 % because the specification as filed shows alumina (i.e. as oxide) being present in *resulting* pigment in an amount within a range of 3.2-14.5 (See page 15, Table 1).

9. Claims 1-8, and 10-11 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-8, 10-11 of copending

Art Unit: 1762

Application No. 11/008,368. Although the conflicting claims are not identical, they are not patentably distinct from each other because it is well known in the art that photoactive semiconductor particles include TiO_2 , as evidenced by US 4305082 to Kusakawa et al (See column 4, lines 46-47).

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

10. Claims 1-8, and 10-11 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3, 5-12, 17, and 19-22 of copending Application No. 11/011,670. Although the conflicting claims are not identical, they are not patentably distinct from each other because the scope of the Application '670 is broader than that of current Application, because the sequence of adding components is not limited to any particular order.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 10 is rejected under 35 U.S.C. 102(b) as being anticipated by Guez et al (US 6200375).

Guez et al disclose a method for treating titanium dioxide nanoparticles comprising contacting an aqueous slurry of the titanium dioxide nanoparticles with a phosphorous compound (claimed densifying agent) (See column 3, lines 60-62); treating the aqueous slurry with a source of silica to form silica treated titanium dioxide nanoparticles; treating the silica treated titanium dioxide nanoparticles with a source of alumina to form silica and alumina treated titanium dioxide nanoparticles (See column 4, lines 34-65).

14. Claims 1, 3-5, 8, and 10-11 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Bettler et al '278 (US 20030089278).

Bettler et al '278 disclose easily dispersing (See P1) TiO₂ pigment coated sequentially in a wet treatment process with hydrous silica and hydrous alumina both in the presence of citric acid wherein the *resulting* pigment is coated from 3 to 6% silica based on the weight of the untreated TiO₂, and with from 1 to 4% amorphous alumina based on the weight of the untreated TiO₂ (See Abstract). The pigment is coated using a process as claimed (See P11-19). Level of citric acid is typically 0.5% citric acid based on weight of untreated TiO₂ (See P25).

Bettler et al '278 are applied here for the same reasons as above. Although Bettler et al do not expressly teach that alumina is deposited in an amount within a range of 5-18%, it is the Examiner's position that 4% amorphous alumina of Bettler et al in the *resulting* pigment of Bettler et al corresponds to an amount of uncured wet alumina within claimed range of 5-15 % because the specification as filed shows alumina being present in *resulting* pigment in an amount within a range of 3.2-14.5 (See page 15, Table 1).

It is well known in the art that TiO₂ pigment particles are typically of nanometer size for better dispersibility, or it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used TiO₂ pigment particles of nanometer size in Pritchard et al with the expectation of providing the desired dispersibility.

15. Claims 1, 4-6, 8, 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pritchard et al (US 3,825,438) in view of Tooley (US 6,429,237).

Pritchard et al disclose a process for coating titanium dioxide pigment with at least one hydrous oxide of a metal such as Si (See column 1, line 58), Al (See column 1, line 56), cerium (See column 1, line 56) comprises mixing an aqueous dispersion of a titanium dioxide pigment with tartaric or citric acid (claimed densifying agent) (See column 2, line 45) prior to adding any coating reagent (See column 2, lines 66-67) such as sodium silicate (See column 1, lines 71-72) sodium aluminate (See column 1, lines 68-69). The amount of hydrous oxide of silicon and aluminum may vary over wide limits, typically it can be up to 15 % (expressed as oxide) on TiO₂ (See column 2, lines 1-6). A rutile titanium dioxide pigment is milled before coating (See column 3, lines 12-16). The densifying agent may be used in amount of 0.2 wt % (See column 3, lines 56-59). The silica layer may be deposited at 50 °C and pH 8.5 (See column 3, line 32-41), and alumina layer may be deposited at 50 °C and pH 8 (See column 45-50, line 32-41).

Art Unit: 1762

Pritchard et al fail to teach that: rutile titanium dioxide particles are milled to nanometer scale; and silica is deposited first, then alumina.

Tooley '237 teach that rutile TiO_2 for pigment has average particle size (See column 3, lines 49-50, 66) usually in the range 150-400 nm for *effective* performance as a white pigment (See column 4, lines 1-2). Preferably the TiO_2 is coated with silica first in an amount of 1-20 wt. %, and then with alumina in an amount of 1-10 wt. % (See column 4, lines 39-3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used rutile titanium dioxide nanoparticles in Pritchard et al and have deposited on the nanoparticles first dense layer of silica and then a layer of alumina with the expectation of providing the desired white durable pigmentary titanium dioxide, since Tooley teach that rutile TiO_2 for pigment has average particle size usually in the range 150-400 nm for *effective* performance as a white pigment, and coated with silica first and then with alumina. The TiO_2 may be coated *under* the silica with other oxide coating (See column 4, lines 52-58).

As to claim 6, Tooley '237 teach that the coated TiO_2 may be further treated with organic material, such as organosilane having the formula $\text{SiR.sub.1 R.sub.2 R.sub.3 R.sub.4}$, wherein least one R group is a non-hydrolyzable non-functional organic group and at least one R group is a hydrolyzable group selected from the group consisting of **alkoxy** (See column 4, lines 59-67). Silane coatings are disclosed in U.S. Pat. No. 5,562,990 (See column 5, lines 1-2).

It is well known in the art that TiO_2 pigment particles are typically of nanometer size for better dispersibility, or it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used TiO_2 pigment particles of nanometer size in Pritchard et al with the expectation of providing the desired dispersibility.

Art Unit: 1762

16. Claims 1, 3-6, and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bettler et al '278 in view of Tooley '237.

Bettler et al '278 are applied here for the same reasons as above. Bettler et al '278 do not expressly teach that TiO_2 are nanoparticles; and each of silica and alumina is deposited in an amount within a range of 5-18% (Claim 1).

Tooley '237 teach that rutile TiO_2 for pigment has average particle size (See column 3, lines 49-50, 66) usually in the range 150-400 nm for *effective* performance as a white pigment (See column 4, lines 1-2). Preferably the TiO_2 is coated with silica first in an amount of 1-20 wt. %, and then with alumina in an amount of 1-10 wt. % (See column 4, lines 39-3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used rutile titanium dioxide nanoparticles in Bettler et al '278 and coated with silica in an amount of 1-20 wt. %, and with alumina in an amount of 1-10 wt. % with the expectation of providing the desired white durable pigmentary titanium dioxide, as taught by Tooley '237.

As to claim 6, Tooley '237 teach that the coated TiO_2 may be further treated with organic material, such as organosilane having the formula $\text{SiR.sub.1 R.sub.2 R.sub.3 R.sub.4}$, wherein least one R group is a non-hydrolyzable non-functional organic group and at least one R group is a hydrolyzable group selected from the group consisting of **alkoxy** (See column 4, lines 59-67). Silane coatings are disclosed in U.S. Pat. No. 5,562,990 (See column 5, lines 1-2).

17. Claims 1, 4, 5, 8, 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pritchard et al in view of Brand et al (US 5,730,796).

Pritchard et al are applied here for the same reasons as above. Pritchard et al fail to teach that silica is deposited first, then alumina.

Art Unit: 1762

Brand et al '796 teach that coating a rutile titanium dioxide pigment with cerium oxide and dense amorphous silica deposited thereon, and preferably an outer coating of alumina deposited thereon provides an improved durability, i.e., an improved resistance to photo chemical degradation (See column 1, lines 28-40).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have deposited on TiO_2 particles of Pritchard et al a first layer of cerium oxide, a second layer of dense silica, and then alumina layer with the expectation of providing the desired improved durability, i.e., an improved resistance to photo chemical degradation, as taught by Brand et al.

It is well known in the art that TiO_2 pigment particles are typically of nanometer size for better dispersibility, or it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used TiO_2 pigment particles of nanometer size in Pritchard et al with the expectation of providing the desired dispersibility.

18. Claims 2, 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pritchard et al in view of Brand et al '796, further in view of Brand et al (US 5,700,318).

Pritchard et al in view of Brand et al '796 are applied here for the same reasons as above.

As to claim 2, Pritchard et al in view of Brand et al '796 fail to teach that alumina is deposited under the silica layer.

Brand et al '318 teach that durability and low chemical and photochemical reactivity is *typically* obtained by coating a pigment with silica, alumina, and other metal oxide coatings (See column 1, lines 20-26). Brand et al '318 teach that alumina-coated TiO_2 pigment (See column 3, lines 5-6) having a first coating of boehmite alumina, a second coating of amorphous alumina, and

Art Unit: 1762

a third coating of boehmite alumina exhibit good durability, dispersibility, and optical properties in plastic compositions (See Abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed boehmite alumina as a first layer in Pritchard et al in view of Brand et al '796 instead of cerium oxide since Brand et al '318 teach that TiO₂ pigment having a first coating of boehmite alumina, a second coating of amorphous alumina, and a third coating of boehmite alumina exhibit good durability, dispersibility, and optical properties in plastic compositions, and Pritchard et al do not limit their teaching to specific order of metal oxide layers.

As to claim 3, Brand et al '318 teach that U.S. Pat. No. 3,409,454 discloses an alumina-coated titanium dioxide pigment and process for obtaining the same wherein the alumina is precipitated onto the pigment under alkaline conditions (pH greater than 10) for improved pigment dispersibility in plastics (See column 2, lines 5-9). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to have deposited outer alumina layer in cited prior art pH greater than 10 with the expectation of providing the desired for improved pigment dispersibility in plastics, as taught by Brand et al '318.

19. Claims 2, 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bettler et al '278 in view of Tooley '237/Pritchard et al in view of Tooley '237/, further in view of Brand et al (US 5,700,318).

As to claim 2, the cited prior art fails to teach that alumina is deposited under the silica layer. Brand et al '318 teach that durability and low chemical and photochemical reactivity is *typically* obtained by coating a pigment with silica, alumina, and other metal oxide coatings (See column 1, lines 20-26). Brand et al '318 teach that alumina-coated TiO₂ pigment (See column 3, lines 5-6) having a first coating of boehmite alumina, a second coating of amorphous alumina, and

Art Unit: 1762

a third coating of boehmite alumina exhibit good durability, dispersibility, and optical properties in plastic compositions (See Abstract).

It is the Examiner's position that amorphous silica layer is functionally equivalent to amorphous alumina layer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have formed boehmite alumina as a first layer, amorphous silica layer and a third boehmite alumina layer on TiO_2 pigment particles of the cited prior art with the expectation of providing the desired good durability, dispersibility, and optical properties in plastic compositions, as taught by Brand et al '318.

As to claim 3, Brand et al '318 teach that U.S. Pat. No. 3,409,454 discloses an alumina-coated titanium dioxide pigment and process for obtaining the same wherein the alumina is precipitated onto the pigment under alkaline conditions (pH greater than 10) for improved pigment dispersibility in plastics (See column 2, lines 5-9). Therefore, It would have been obvious to one of ordinary skill in the art at the time the invention was made to have deposited outer alumina layer in cited prior art pH greater than 10 with the expectation of providing the desired for improved pigment dispersibility in plastics, as taught by Brand et al '318.

20. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pritchard et al in view of Tooley '237/Pritchard et al in view of Brand et al '796/, further in view of Jacobson (US 5,340,393).

Pritchard et al in view of Tooley '237/Pritchard et al in view of Brand et al '796/ are applied here for the same reasons as above. Pritchard et al in view of Tooley '237/Pritchard et al in view of Brand et al '796/ fail to teach that silica is deposited at pH of at least 10.

Art Unit: 1762

Jacobson teaches that silica deposited on TiO_2 particles by forming an aqueous suspension of the particles, adding a dispersion aid such as citric acid (See column 1, lines 55-56) and heating with agitation to a temperature in the range of 60°C to 100°C , then adding an alkali silicate solution (See column 1, lines 47-69) and maintaining pH in the range of 7 to 11 provides *non-agglomerated* TiO_2 particles coated with dense amorphous silica (See column 2, lines 1-5).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have carried out silica deposition in cited prior art at a temperature in the range of 60°C to 100°C and maintaining pH in the range of 7 to 11 with the expectation of providing the desired *non-agglomerated* TiO_2 particles coated with dense amorphous silica, as taught by Jacobson.

21. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bettler et al '278 in view of Tooley '237 and Tooley et al (US 5,562,990) or Pritchard et al in view of Tooley '237 and Tooley et al (US 5,562,990).

Bettler et al '278 in view of Tooley '237/Pritchard et al in view of Tooley '237 are applied here for the same reasons as above. As was discussed above, Tooley '237 teach that the coated TiO_2 may be further treated with organic material, such as organosilane having the formula $\text{SiR.sub.1 R.sub.2 R.sub.3 R.sub.4}$, wherein least one R group is a non-hydrolyzable non-functional organic group and at least one R group is a hydrolyzable group selected from the group consisting of **alkoxy** (See column 4, lines 59-67). Silane coatings are disclosed in U.S. Pat. No. 5,562,990 (See column 5, lines 1-2).

Tooley et al '990 teach that organosilane is octyltriethoxysilane.

Art Unit: 1762

Conclusion

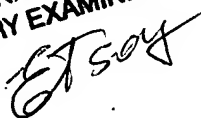
22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is 571-272-1429. The examiner can normally be reached on Monday-Thursday, 9:00AM - 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-142323. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Elena Tsoy
Primary Examiner
Art Unit 1762

ELENA TSOY
PRIMARY EXAMINER



December 22, 2006